

MEMORANDUM

To: Delaware EEAC

From: Optimal Energy, EEAC Consultant

Date: January 6, 2020

Subject: Avoided costs for use in cost-effectiveness analysis

SUMMARY

In February of 2017, the Delaware EEAC approved avoided costs to be used in assessing the cost-effectiveness of energy efficiency measures and programs implemented by the Delaware utilities. In 2019, the EEAC Consultant Team undertook an effort to update these avoided costs to reflect more current market conditions. Based on discussions with the EM&V Committee of the EEAC, we determined that the best approach for updating the avoided costs would be to maintain the same methodology used in 2017, but to include updated inputs where possible. With the help of members from the EM&V Committee, the Consultant Team developed new avoided costs based on the following updated inputs:

- Gas service rate (GSR) or gas commodity rate (GCR) for Delmarva Power & Light (DPL) and Chesapeake Utilities
- Avoided electric energy and capacity costs developed for the Maryland Energy Administration (MEA) for use by DPL in their Maryland service territory
- The value of avoided Renewable Energy Credits (RECs) and Solar Renewable Energy Credits (SRECs) as defined by 26 Del. C. §§352(18)

A draft of the updated avoided cost values were first presented to the EM&V Committee at its November 2019 meeting. The purpose of this memo is to summarize the inputs and methodology used to calculate update the avoided costs in Delaware, which is done in the sections below.

GENERAL APPROACH TO AVOIDED COSTS

To develop avoided costs in a timely manner to support energy efficiency plan submissions by Delaware utilities and other energy efficiency program administrators, the Council has relied on available data from relevant jurisdictions and public sources. The intent is to use these avoided costs until such time as a Delaware-specific study can be completed. Until then, the approved avoided costs are sufficient to support decisions regarding the cost-effectiveness of efficiency measures, programs, and portfolios. As in 2017, a single state-wide set of avoided costs for electric energy and capacity has been developed to ensure consistency and comparability in program cost-effective results. Specific natural gas avoided costs for each utility, due to the differences in gas supply cost and the relative simplicity of splitting the

territory areas have been developed. The Consultant Team recommends that the avoided costs be applied for all 3-year plans developed after the date by which the avoided costs are approved. This will provide program administrators with a more consistent basis for planning their programs.

Gas Avoided Costs Calculation

Gas avoided costs are primarily based on each gas utility's gas service rate (GSR) or gas commodity rate (GCR). Previous conversations with both Chesapeake Utilities and DPL indicated that this rate represents the avoidable marginal cost of supplying gas to customers. It includes the variable costs of gas transportation from the pipeline take-off point. It does not include fixed costs or other expenses that do not vary with the amount of gas supplied. These rates are also filed with the Delaware Public Service Commission.

Both Chesapeake Utilities and DPL provided the Council's consultant with information on their filed GSR/GCR for 2018-2019 and the portion of that rate that represents prior-year reconciliations and which are therefore deducted from the filed values to represent only the marginal cost of gas. Future years' GSR/GCR is based on the projections for changes in gas prices in the Mid-Atlantic region developed by the Energy Information Administration (EIA).¹ Each utility's base GSR/GCR was converted from units of million cubic feet (MCF) to million British thermal units (Btu) assuming a heat rate of 1.036 MMBtu per MCF.² The table below presents the updated gas avoided costs for the years 2020-2040.

¹ EIA, Annual Energy Outlook, Table 3.2, Middle Atlantic Energy Prices, 2019

² Source: <https://www.eia.gov/tools/faqs/faq.cfm?id=45&t=8>

Avoided Costs - Gas

Year	Chesapeake \$/MMBtu	Delmarva \$/MMBtu
2020	\$8.78	\$5.66
2021	\$8.99	\$5.80
2022	\$9.28	\$5.99
2023	\$9.64	\$6.22
2024	\$10.00	\$6.45
2025	\$10.17	\$6.56
2026	\$10.24	\$6.61
2027	\$10.28	\$6.64
2028	\$10.33	\$6.67
2029	\$10.36	\$6.69
2030	\$10.40	\$6.72
2031	\$10.42	\$6.73
2032	\$10.50	\$6.78
2033	\$10.58	\$6.83
2034	\$10.62	\$6.85
2035	\$10.67	\$6.88
2036	\$10.71	\$6.91
2037	\$10.77	\$6.95
2038	\$10.79	\$6.96
2039	\$10.82	\$6.98
2040	\$10.86	\$7.01

Electric Avoided Costs Calculations

Avoided electric energy costs are based on values developed for the Maryland Energy Administration (MEA) for use by DPL in their Maryland service territory.³ DPL's service territory in Maryland and Delaware together compose a single zone as defined by PJM, the regional system operator. We are using the reported avoided energy costs including a component for demand-reduction induced price effects, or DRIPE. To these avoided costs we have added the value of avoided Renewable Energy Credits (RECs) and Solar Renewable Energy Credits (SRECs) as defined by 26 Del. C. §§352(18) and (25). In 26 Del. C. §354(a) the requirement to acquire RECs and SRECs is tied to total state electric sales, reductions in sales from efficiency programs reduce the need to acquire RECs/SRECs.

Electric energy avoided costs in the MEA study are specified by energy period: winter on-peak and off-peak and summer on-peak and off-peak. To simplify the avoided costs into a single set of projections for each customer sector (i.e., residential or commercial), we developed a composite load shape of energy savings from efficiency measures based on the end-uses likely to represent a majority of energy savings. Avoided electric capacity costs are also based on the MEA study. Avoided capacity costs are composed of generating capacity, transmission and distribution capacity, and DRIPE. The table below presents the updated gas avoided costs for the years 2020-2040.

³ Maryland avoided cost model, August 2017. Model was updated by MD utilities' evaluator (Navigant), in collaboration with MD electric utilities, PSC Staff with their consultant (Itron), and the Maryland Office of People's Council

Year	Avoided Electric Energy		Avoided Electric Capacity
	Residential (2020\$/MWh)	Commercial (2020\$/MWh)	All Users (2020\$/kW)
2020	\$55.52	\$60.27	\$108.83
2021	\$63.66	\$68.50	\$120.89
2022	\$70.57	\$75.50	\$122.97
2023	\$68.23	\$73.26	\$125.10
2024	\$49.76	\$54.90	\$109.99
2025	\$50.82	\$56.06	\$112.20
2026	\$51.80	\$57.14	\$114.46
2027	\$52.80	\$58.25	\$116.77
2028	\$53.81	\$59.37	\$119.12
2029	\$54.85	\$60.52	\$121.51
2030	\$55.91	\$61.70	\$123.96
2031	\$56.99	\$62.89	\$126.45
2032	\$58.09	\$64.11	\$129.00
2033	\$59.21	\$65.36	\$131.60
2034	\$59.47	\$65.73	\$133.53
2035	\$59.73	\$66.10	\$135.50
2036	\$59.99	\$66.48	\$137.49
2037	\$60.25	\$66.86	\$139.52
2038	\$60.51	\$67.24	\$141.57
2039	\$60.78	\$67.62	\$143.66
2040	\$61.04	\$68.01	\$145.77

Formulae

Gas avoided cost = [(Utility GCR/GSR) – (prior year reconciliation)] x (EIA price escalator) x (MMBtu/MCF conversion)

Electric energy avoided cost = (DPL avoided energy cost from MD) + (DPL energy DRIPE from MD) + (value of DE avoided REC/SREC purchases)

Electric capacity avoided cost = (DPL avoided capacity cost from MD) + (capacity DRIPE)